

The Citrus Industry

Vol. 25 — No. 4

APRIL, 1944

15 Cents A Copy

MORE FUNDS FOR CITRUS LABORATORY

Florida citrus interests will be much interested in the announcement just made by Congressman Peterson that a congressional sub-committee on agricultural appropriations has reported favorably a bill which carries an increased appropriation of \$40,000 for the United States Citrus By-Products Laboratory at Winter Haven. Notice of this action by the sub-committee was recently received by the Florida Citrus Commission.

The laboratory, one of the really important factors in the Florida citrus industry, operated last year on a federal appropriation of \$19,000, supplemented with an additional \$18,000 from the Florida Citrus Commission for extra help and equipment.

For a number of years the laboratory has taken an active part in research work, inaugurating numerous new by-products and pointing the way to improvement in established processes. Due largely to the work of the laboratory, there has been a marked improvement in the quality of citrus concentrates and in canned citrus juices, and in the development of powdered citrus concentrates.

The work of the laboratory has been handicapped by lack of sufficient funds, and if the bill reported favorably by the congressional sub-committee is approved by congress the station will be in position to go forward with its research work on a more elaborate scale and to the great advantage of the industry.

WAR PRISONERS TO AID INDUSTRY

The Florida citrus industry which has contributed handsomely to every phase of the war effort, is now to receive some return in the form of labor to be performed by German prisoners of war.

John A. Snively, jr., president of the Florida Orange Festival, announced recently that plans have been completed to bring 250 German prisoners of war to work in citrus packing and canning plants now handicapped by a shortage of labor.

The grounds and buildings of the Florida Orange Festival at Winter Haven have been leased to the army for a period of six months. Formerly used to house recruited farm labor in the citrus groves, they will now be used to house the German war prisoners. Already the army is installing road blocks and surrounding the grounds with

a fence barrier.

The prisoners will be allocated to packers and canners in accordance with their needs as shown by statements filed with the proper authorities. Under the program outlined the army will pay for the maintenance of the prisoners while the citrus groups taking part in the program will pay for the utilities and the rent.

While the 250 prisoners to be brought into the citrus field will be wholly inadequate to supply the needs of packers and canners, they will at least help to relieve the existing shortage of labor under which such plants have been operating.

REFRIGERATION BAN LIFTED

Lifting of the ban on use of refrigerated cars for the shipment of citrus fruits to points south of the Ohio and Potomac rivers has resulted in the renewal of shipment of quantities of fruit to many points in Southern territory and the movement of much fruit which otherwise would have spoiled.

The ban on use of refrigerator cars for shipment of citrus fruits to the territory in question has been in effect since Jan. 14 under an order of the Interstate Commerce Commission. Lifting of the ban was brought about by the Office of Defense Transportation largely through the efforts of Senator Andrews and Congressman Peterson, which culminated in a conference between the Interstate Commerce Commission and the Office of Defense Transportation with railway representatives and Florida growers.

The effect of the lifting of the ban was immediately noticeable in the increased movement of fruit to the points affected.

THE FOOD SITUATION

The most complete picture yet presented of the wartime food situation in the United States appears in a report just issued by the Food Administration, entitled "Food Program for 1944." Showing that civilians will get less of some food products than last year, the review emphasizes that there will be no need of anyone going hungry.

In the fruit field, it is stated that civilians will get less of some fruits, but that this shortage will be at least partially made up by a larger supply of citrus fruits even though the requirements of the armed forces will take up a greater portion of the canned and concentrated citrus products.

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EARLY!*



Because of a recent supplementary allocation of organic nitrogen and potash-bearing materials for the balance of the season ending June 30, 1944, there has been some improvement in the availability of restricted fertilizer materials needed for the late spring and early summer citrus applications.

While this represents a welcome easing of the situation and enables us to offer IDEAL formulas that come closer to your usual needs, it does not mean that restrictions have been completely relaxed or that all materials are now plentiful.

Due to shortage of labor, shipments of fertilizer for summer citrus application should begin early and should be spread over April, May and June instead of being concentrated in the month of

May. Early orders will probably help you avoid disappointments that might arise from several causes, including labor and transportation problems.

Your nation needs your best production this year. You can serve best by cooperating in every way to help solve unavoidable and difficult problems. This year, as in every year for more than half a century, you can place full reliance in the quality and dependability of IDEAL FERTILIZERS.



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NO! NO!
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AMERICA'S greatest postwar duty will be jobs for returning service men and women . . . and especially for disabled veterans.

Only by planning now can we unfailingly pay our debt to those who have been disabled in our nation's defense. *They must be given the opportunity to work as ably as non-handicapped persons.*

They must know that jobs will await them on completion of rehabilitation training . . . full time, full wage jobs in surroundings where they will find health, happiness, self-respect and a sense of achievement. This knowledge will promote mental serenity and speed their recovery.

Florida is fortunate in being able to show America the way and at once begin the placement of handicapped veterans in the development of her unrivaled natural resources—sunshine, rainfall and fertility.

In the United States Sugar Corporation's plans for immediate and future expansion we stand committed to our share of this worthwhile effort. We invite all employers to join us in creating opportunities for handicapped veterans. Communicate with State Headquarters or the Washington office of the Veterans' Administration or your local posts of veterans' organizations.



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We want you to know that we deeply appreciate this patronage . . . which reflects the confidence we know that you feel in stock which is supplied by our nurseries . . . as well as the knowledge that everything we sell must prove satisfactory.

We regret that many current orders which are now being received cannot be filled . . . but we are booking orders for future deliveries and would recommend that growers who desire to insure delivery of specific varieties and sizes book their orders with us well in advance of the next planting season.

Glen St. Mary Nurseries Company

Citrus Division

WINTER HAVEN, FLORIDA

A. G. Scott, General Manager

E. J. Parker, Production Mgr.

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Publication office at Bartow, Florida. Entered as second class matter February 16, 1920, at the post office at Tampa, Florida, under the act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

Florida Citrus By Air Express

It is a far cry from the old days of slow moving river steamboat to present day air express and while, owing to its bulk and weight, little Florida citrus may be expected to find its way to market by airplane, growers may be interested in a recent survey conducted with a view to showing the immense possibilities of such service to fresh fruit growers in the days following the end of the war.

Because of its closeness to the great Eastern and Midwestern centers of population, Florida should benefit tremendously from the development of air-freight service in the United States. This is among the conclusions reached in a special Florida supplement to a comprehensive study of actual and potential traffic in fresh produce just completed by a group of Wayne University (Detroit) professors headed by Dr. Spencer A. Larsen, and published by the Wayne University Press.

The National study forecasts that in the years immediately following the war, fresh produce alone will furnish enough air cargo to total more than 233 times the combined weights of all commodities carried by air in 1941 — provided air-freight rates are reduced to five cents per ton-mile — a figure which

many authorities see as possible in the near future. Even at seven cents a mile, fruit and vegetable traffic equal to 80 times the 1941 figure for all air express is expected to develop.

The survey emphasizes the importance to the future air-freight business, pointing out that more than 11 percent of all fresh produce moved over 250 miles in the United States is grown in this state. Calling attention to the fact that Chicago is about 600 air miles closer to Florida's growing areas than it is to California, the report states that the relatively short distances between Florida and its markets should give the state strong competitive advantages in the coming Air Age.

The Wayne report is the first exhaustive survey of the field to be published in this country. It will be followed by a series of studies designed to explore the entire air freight picture in its relation to other forms of transportation. The report embodies the results of an investigation begun more than a year ago under a grant made to the University by Col. Edward S. Evans, loading authority, aviation pioneer, and president of the Evans Products company.

"This study was undertaken with a free and open mind," Colonel

Evans said, "and without any preconceived idea of 'making a case' for air cargo. The motivating thought was to produce through scientific research a reasonably accurate picture of the potential of air cargo in the postwar world. The importance of this picture to airplane manufacturers, airline operators, and producers and distributors of commodities is obvious, but it is just as important to the city planner, faced with the problem of determining the place which cargo airports should occupy in our cities, and to the consumer whose standard of living will undoubtedly be improved in the coming Air Age."

Air shipment, the study asserts, will bring fruits and vegetables to market in garden-fresh condition, with their original flavor, vitamin-content, and appearance unimpaired. These factors alone, it is stated, will insure the grower substantially higher returns than he gets from produce shipped by conventional methods. Other benefits include the savings which will be made through the elimination of spoilage in transit and the added profits which should result from the rapid marketing of high-value early crops.

"Before the war," the study points out, "produce was in transit between Florida and Detroit

(Continued on page 22)

A Study Of The Irrigation Of Citrus Groves In Vero Beach Section

By T. W. YOUNG, Associate Horticulturist
Coastal Citrus Experiment Station, Lake
Alfred, at Meeting Florida State
Horticultural Society

Introduction

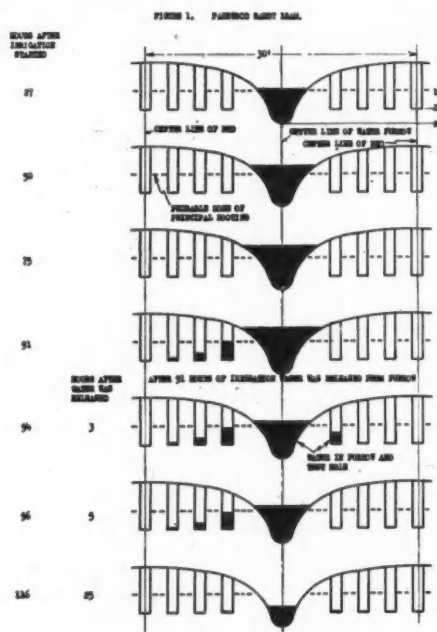
Several different methods of irrigating citrus groves are used in the low-lying artesian areas of the coastal and interior regions of Florida. The one most commonly practiced differs from the method of irrigation in the Ridge and other regions of relatively high elevation because of dissimilarities between the two regions in the source of irrigation water, drainage, and soil texture. In the Ridge and some other interior sections irrigation water is obtained mostly from lakes, ponds, streams, and occasionally from wells. In the Ridge and other sections of relatively high elevation both surface and sub-drainage are generally excellent and the groves are planted flat. In the low-lying areas drainage is poor and the trees are generally planted on beds or mounds to improve this condition. The citrus soils of the Ridge and other areas of high elevation are mostly light, principally sands, through which water percolates readily. A large majority of the groves in the low-lying regions are planted on heavy loam soils through which water percolates slowly.

In the Ridge and other non-artesian areas the water is pumped from its source to the grove through underground or surface mains. Distribution in the grove is by means of some sort of conductor pipe, generally slip-joint or lock-joint metal pipe. Application to the soil may be by flooding at the end of the conductor pipe or by sprinkling along the entire length of conductor pipe through perforations or sprinkler gates in the pipe which is laid in the tree row middles. This has proved to be a highly satisfactory and effective method of irrigation on flat planted groves such as those in the central Ridge sections.

This method of irrigation is used to a small extent in the coastal regions on groves planted on comparatively high elevations where it has not been necessary to bed or mound the soil to provide adequate drainage. However, in the low

hammock, flatwoods, and prairie areas, which constitute the principal part of the coastal and interior citrus regions in artesian areas, the trees are generally on beds or mounds; and the growers have never considered the conductor pipe method of irrigation to be

Since the bedding up of these groves automatically provides a water furrow between the tree rows, a rather simple method of grove irrigation has been developed in the level coastal and interior citrus regions where flowing artesian wells can be obtained. For irrigation



practical for various reasons. One is the difficulty of moving the pipe over the beds or mounds. Another objection to conductor pipe irrigation is the uneven distribution of water in the bedded or mounded groves which is obtained when a large volume of water is applied to a relatively small area in a short period of time. There is a large run-off particularly from the beds or mounds on heavy loam soil, with this type of irrigation. The principal part of the water collects in the middle and percolates downward in the zone of least root concentration according to the opinion of most growers in these sections. Also, with some wells the salt content of the water may be sufficiently high to cause excessive corrosion of irrigation pipe.

purposes in such areas it has been the practice to sink artesian wells in or near the grove; the number depending upon the flow and the amount of water needed. Conduction to the various blocks of grove is generally through open ditches, although in a few groves permanent pipe or tile lines have been laid beneath the surface for this purpose. These ditches or water lines serve as headers and generally connect with the water furrows across both the upper and lower ends of each block by means of cuts or tile through the ditch bank. When the layout of the grove does not permit a header at both ends, the header is always placed at the lower end to insure drainage. A series of gates are usually provided to control the water flow in each

section of header ditch or line. The flow of water into individual furrows is controlled by earthen dams in the cuts through ditch banks or plugs in the ends of the tile.

When it is desired to irrigate a certain block of trees and connections are opened between the water furrows in this block and the header through which water is to be brought to the block. If this happens to be on the upper end of the block the connections between the furrows and the header on the lower end are closed. However, if there is a header only on the lower end the water will be brought in through it and the connections to the furrows from this header are then left open. The gates in the header through which water is to enter are then closed to confine the water to this particular block. Finally the well or wells supplying the block are opened and let run until the water has reached a level in the furrows which is, in the opinion of the operator, sufficiently high to provide the needed moisture in the beds. If there are low areas in the block the water may be shut out of the furrows through such areas until those in the higher areas have filled. The size of the block covered by one operation is dependent upon the layout of the grove, the amount of water available, and on the character of the soil. It may range from an acre or so to 10 acres or more. However, 10 acres is generally as much as can be handled at one time to an advantage by this type of irrigation. Upon completing the irrigation of one block the water may be shifted to another block or drained from the grove. This is accomplished by opening the connections between the furrows and the header on the lower end of the block and the proper manipulation of the gates in the header.

The length of time the water is allowed to remain in any one block before being shunted into another block or drained from the grove, is, of course, dependent upon previous moisture conditions in the grove and the character of the soil. The average irrigation probably requires about 3 days; however, when the soil is very dry or percolation slow, as in heavy loam soils, the irrigation interval may be for 4 or 5 days. Occasionally some operators will let the water remain in one block for a week or slightly longer when recovery from wilting is not apparent sooner. In light sandy soils where percolation

is rapid, or in soils with fair moisture, the irrigation interval may last for only sufficiently long to raise the water a short distance up the sides of the bed. This may require only a day or even less. On the heavier soils the water is generally put in every middle and is frequently raised in the water furrow to within 6 or 8 inches of the top of the bed. On the lighter soils, bringing the water to within 10 to 12 inches of the top of the bed is considered to be sufficient. Sometimes on sands percolation is so rapid that it is only necessary to

run irrigation water through every other furrow in order to wet entirely through the bed in a reasonable length of time.

This method of irrigation is cheap since no pumps and a minimum of piping and labor is required. However, there is a great difference in opinion among the growers in the regions where such irrigation is practiced as to its effectiveness. Some growers maintain that, when conditions are not too unfavorable, this type of irrigation properly used will prevent a great portion of the "June" drop of fruit. It is

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also considered by some to give an increase in fruit size over unirrigated groves, particularly when applied in July and August droughts, which are not altogether infrequent in these areas. If droughts occur

condition than non-irrigated trees during prolonged droughts in which the soil becomes dry to considerable depths. On the other hand, most growers concede that during a normal dry spell the unirrigated

running, the flow frequently becomes so weak that it is impossible to bring the water sufficiently high in the water furrows in a sufficiently short period of time to effectively irrigate the required area before drought damage results. It has been observed that trees under irrigation on the heavier soils will occasionally wilt almost as rapidly and severely, if not as rapidly and severely, as those similarly situated but not irrigated. In some exceptional cases this has occurred even though the water in the furrows had been allowed to stand within 6 or 8 inches of the bed crown for several days.

With these opinions, observations, and facts in mind it was decided to conduct an investigation in order to determine how effective this furrow irrigation was in increasing the available soil moisture in the zone of root penetration in the bedded groves.

Procedure

For this investigation several groves in the Vero Beach area were selected as being representative and typical of the citrus groves in the low-lying artesian regions. The field work was conducted during the spring, summer, and fall of 1942.

FIGURE 2. PAINTERD HARBOR LOAM.

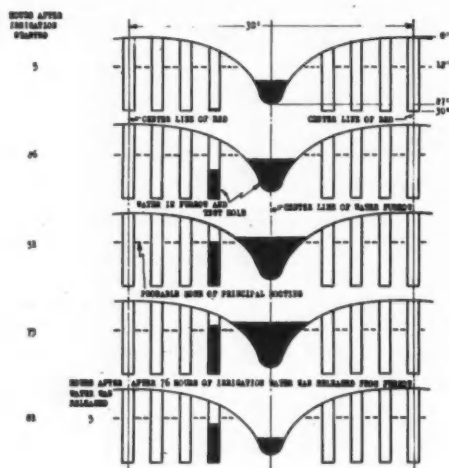


FIGURE 3. PAINTERD HARBOR LOAM.

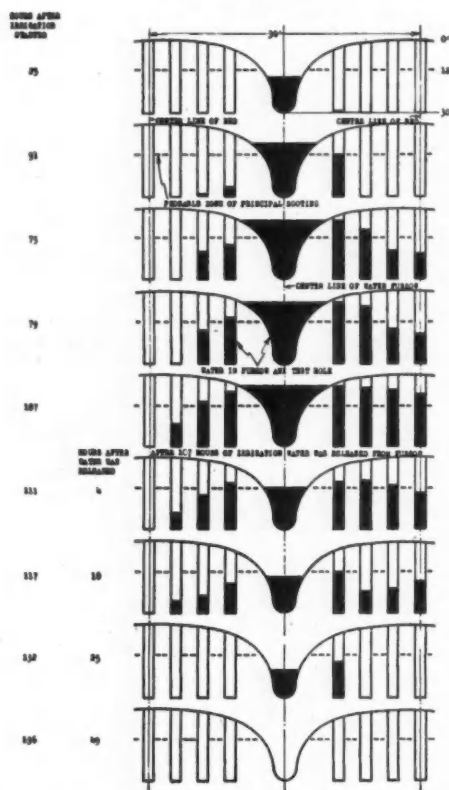
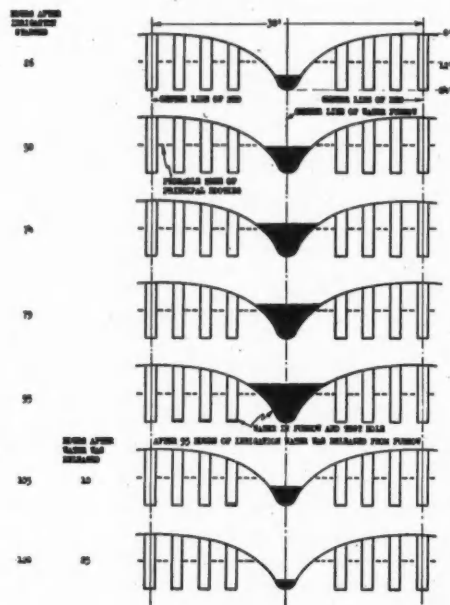


FIGURE 4. PAINTERD HARBOR LOAM.



later in the season the difference in fruit size from irrigated and unirrigated groves is said not to be so pronounced. There seems to be little question that furrow irrigation does keep the trees in somewhat better

trees seem to hold up better for longer periods without rain than do the irrigated groves unless rather frequently irrigated. Moreover, during prolonged droughts when practically all wells in the area are

The soil types included in the study ranged from some of the lightest sands to some of the heaviest loams on which groves are planted in this area. It also included one muck soil. The method used was to dig

a set of vertical holes with a post-hole digger at 3-foot intervals from the centers of two beds toward the water furrows between them as shown in Figs. 1 to 14. In one case on Leon fine sand where water was placed only in every other furrow, holes were sunk entirely across both beds adjacent to the same furrow. This is shown in Fig. 14. The depth to which these holes were sunk was dependent upon the height of the bed crown above the bottom of the water furrow and the height to which it was thought the water would be raised in the furrow. The depth of all holes in any one set was the same below the bed crown and the depths used in the several sets ranged from 18 to 36 inches. The movement of water from the furrow into the beds was determined by measuring from time to time the distance to water in the holes from a line stretched horizontally at bed-crown height above each set of holes. Fourteen such sets were used during the course of this study and 6 different soil series, representing 5 different soil types, were investigated. A description of these soils is given in the appendix.

Considerable variation was found in the rate of water movement through beds even on the same soil series and types. Still more variation was found in the rate of movement through beds on different soil types. This is illustrated graphically in Figs. 1 to 14. Lateral movement in the heavy loam and muck soils (Figs. 1 to 11, incl.) was generally very slow and only for short distances. In such soils rapid lateral movement appeared to be principally through old root channels, worm holes, cracks, and other such openings, or through sand pockets which were occasionally encountered. There was little vertical upward movement by capillarity in the heavier loam soils during the irrigation interval of from 2 to 4 days while the various series were under observation. The maximum vertical rise above the water level of the furrow was about 4 inches in a Bladen loamy sand after 3 days. On the other hand, lateral movement of water through the beds on light sands was rapid and a vertical rise by capillarity of about 8 inches above the level of water in the furrow was noted in both the Plummer and Leon fine sand after a few hours. The rate of lateral movement of water through the beds on light sandy

(Continued on page 11)



There will be no vacation on the farm this year, if those of us whose responsibility it is to produce food for our armed forces and the folks at home do the job as we have planned it. Surplus supplies of food are being rapidly depleted — the man-power shortage becomes more acute each day — but the demand for food will become greater with every passing week.

We seek to help Florida growers produce bumper crops, and invite you to take full advantage of our outstanding facilities and to make use of:

X-CEL FERTILIZERS
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Tampa

Florida

State Citrus Growers Urged To Join Farm Bureau Branch

By James C. Morton

Contrary to the thought of many, the citrus department of the Florida Farm Bureau is not a new citrus growers' organization, but is merely the development of a citrus committee within the Farm Bureau membership to especially devote its efforts toward those matters which are of most vital interest to the Farm Bureau members who are engaged in the production of citrus fruits.

It requires no membership other than membership in the Florida Farm Bureau Federation, has no dues or assessments other than the five dollars per year membership in the Farm Bureau.

Farm Bureau and its work is somewhat new in our state, but has long been established throughout other agricultural areas all over America, devoting itself to the fostering and development of those things which are to the best interests of agriculture in all its various departments.

Farm Bureau in Florida is now building up strength in counties in Florida, north, east, south and west, and as it gains in membership and interest, is naturally (aside from its broad, general purposes and principles) dividing itself into departmental groups, such as cattle raising, vegetables, poultry, etc. This recent development is merely the creation of a citrus committee within the Florida Farm Bureau, which will devote itself in thought, effort and educational work to those matters which most directly affect the welfare of citrus growers.

The citrus department of the Florida Farm Bureau is not a substitute for the splendid work being done by other organizations, but is an amendment to those other organizations, through which the voice of the producers of citrus fruit will be most effectively heard and through which their plans and purposes may be best expressed and their interests justly protected.

Its officers and directors will spend considerable of their own time and money in the work of the committee and on behalf of the members and in behalf of all Florida agriculture. Each of those men is as busy as you, all, are. They

do not have time nor gasoline to call on individual farmers to solicit new members or to collect dues from old members.

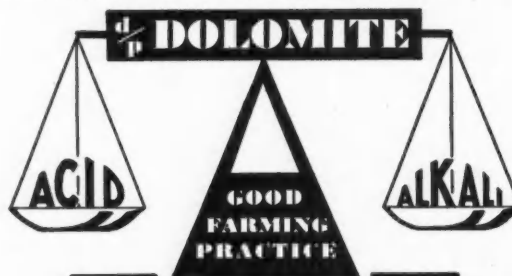
Therefore, each citrus grower, in his own interest, in the interest of agricultural Florida and especially in the interest of citrus Florida, should make it his special business to solicit the membership of his neighbor — and each grower, interested in the welfare of the industry, should send in his membership fee to his County Farm Bureau without solicitation. This is being urged to make the work as light as possible on volunteer workers and to cut down the cost of new membership, so that all membership fees may be available to serve the interests of Florida agriculture.

Every citrus grower in Florida is urged to become a member of

this organization in order that each may have his part in the service and protection which Florida Farm Bureau will give to agriculture. Membership fees should be sent to your County Farm Bureau.

Used Fruit and Vegetable Containers May Now Be Returned

Reduced rail rates are available to growers in the south and southwest to permit the return of all types of used fruit and vegetable containers, it was announced recently by Charles B. Bowling, chief of the transportation rates and services division, Transportation and Warehousing Branch, of the War Food Administration's Office of Distribution. (Continued on Page 15)



Balance brings Profits

With certain fertilizer materials scarce, keep your soil in balanced condition with d/p Dolomite and get the benefits of the plant foods already in the soil that become available when proper acid-alkali balance is restored.

Balanced soil means bigger profits... and better crops at a time when America needs all the food you can raise. Use d/p Dolomite to achieve balance and to supply the calcium and magnesium essential for healthy crops.

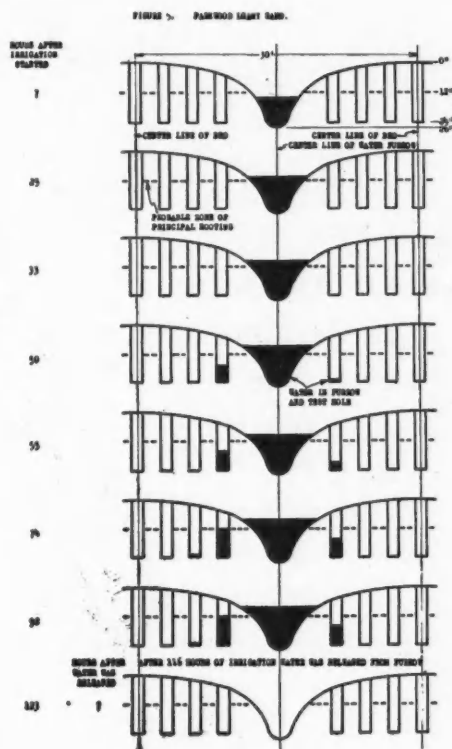


A STUDY OF THE IRRIGATION OF CITRUS GROVES IN VERO BEACH SECTION

(Continued from page 9)

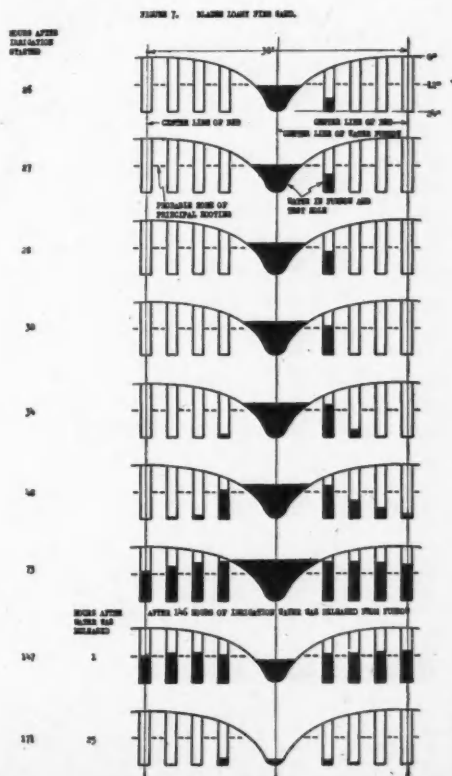
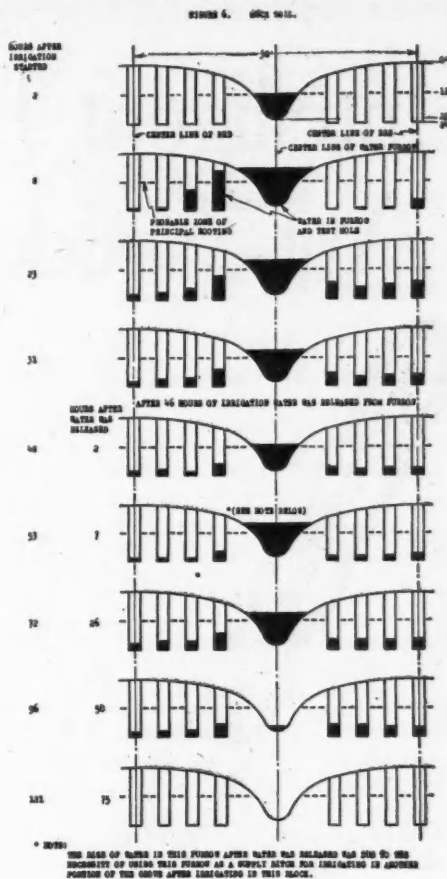
soils is shown in Figs. 12, 13, and 14.

As a preliminary to the present investigation, rooting habit studies were conducted on several representative soils along the East Coast in order to determine the spread

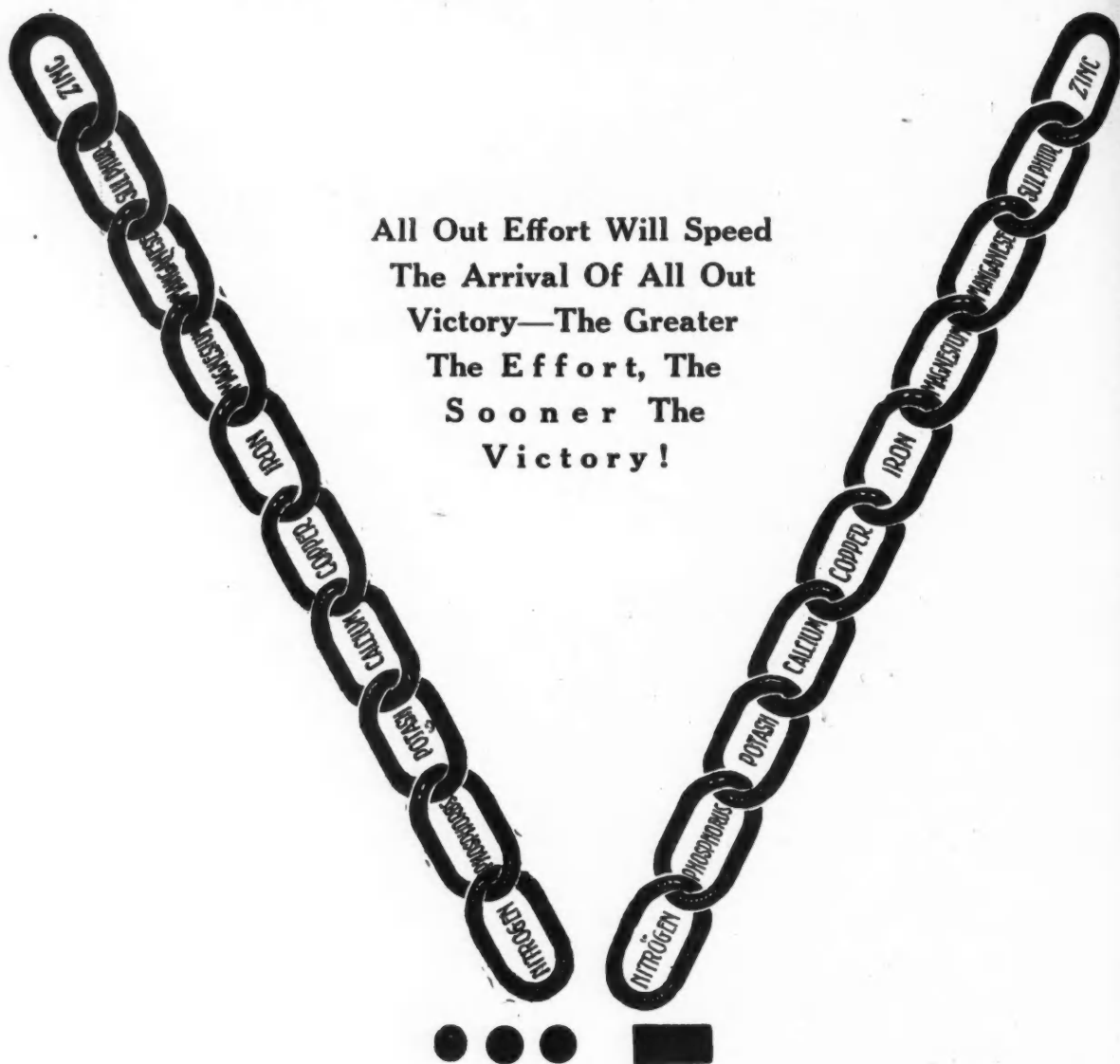


and depth of penetration of citrus roots in the beds on various soils. In the course of this study the root systems of 17 trees, ranging in age from 3 to 18 years, were completely excavated and studied. These studies indicated that the principal zone of root penetration of citrus trees when grown under these conditions was probably in about the top 12 inches of the bed. There was a tendency for the lateral roots to grow more or less parallel to the bed and considerable cross-rooting occurred on the bed. Little cross-rooting occurred across the water furrow and then only on the lighter, better drained soils with shallow water furrows. In general it was found that lateral roots tended to be concentrated on the higher portions of the bed and that fibrous roots tended to be concentrated under the tree crown on the higher

(Continued on page 14)



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Superior's Extra Value Brands Will Aid In Building Sound Production

In ever increasing volume Extra Value Brands have been helping to increase and improve production in the groves and on the farms of Florida for many years.

More and more Florida Growers are coming to recognize the exceptional merit of Extra Value Brands as a valuable portion of their program for increased and improved production.

If you are not fully familiar with the effectiveness of Extra Value Brands we urge you to consult with those growers who do use these fertilizers regularly. Observe their groves and let them tell you of their experience with them.

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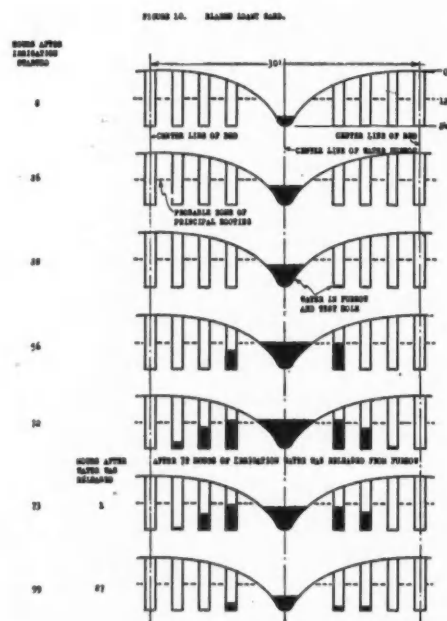
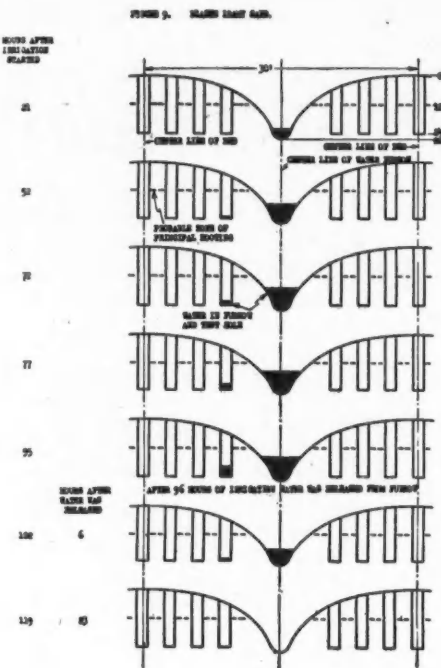
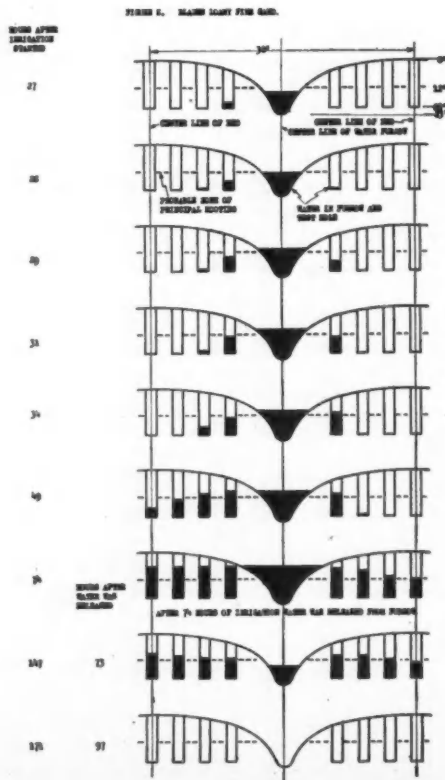
A STUDY OF THE IRRIGATION OF CITRUS GROVES IN VERO BEACH SECTION

(Continued from page 11)

portions of the bed. However, some of the fibrous roots found along the entire length of lateral roots, regardless of location, unless evidence of water damage to the roots was present.

Discussion

A soil is not a solid mass of mineral or organic matter or a mixture of these two. All soils, regardless of their constituent parts, are porous masses. The amount of pore space in a soil is determined by the texture, the shape, and the mode of arrangement of the soil particles, i. e., the soil structure. On the basis of soil texture, which refers to the size of the individual soil particle, there are four fundamental groups of soil, ranging in the following order from coarse to fine texture: gravel, sand, loam and clay. The finer the texture of the soil particles the greater their resistance to compaction. Thus, while a coarse soil such as sand will have larger individual pores than a clay, the latter will have considerably more total pore space. An organic soil such as muck will be even more porous than clay. Of the soil encountered in this investigation,



the fine sands probably had about 35 percent pore space. The loamy sands, loamy fine sands, sandy loams, and muck would follow in ascending order, the latter having perhaps about 75 percent or more pore space.

The pore spaces of a soil normally are occupied by water and air. If the soil is saturated, practically all the pore space is occupied by water. Under such conditions the plant has abundant available water,

(Continued on page 20)

USED FRUIT AND VEGETABLE CONTAINERS MAY NOW BE RETURNED

(Continued from Page 10)

tribution.

Cooperation by the railroads, he said, has made possible the success of WFA's intensive campaign to provide vitally needed shipping packages in the present emergency.

"Effective February 28," he said, "Column 23½ rates from lower Michigan, Indiana, Ohio, the western portions of New York, and Pennsylvania to the southwest; and from upper Michigan, Wisconsin, Minnesota, Iowa, North and South Dakota, Nebraska, Missouri, Kansas and the eastern portions of Colorado and Wyoming to the south, have been published in one day's notice.

"The availability of the rates outlined complements the present plan of the Transportation Division of the Department of Agriculture to assist in making available to the producers an adequate supply of shipping containers. There are now published rates on:

"Used fruit and vegetable containers, set up, nested, or knocked down, folded, or loaded flat, in straight or mixed carloads (baskets and hampers; wire bound crates, or boxes; barrels, half barrels, and till boxes), minimum weight 25,000 pounds when in box cars and 15,000 pounds when in refrigerator cars when the latter are furnished for carrier's convenience. C. L. Rate Column 23½ from all the northern, central, and western states east of the Rocky Mountains to the south."

Many cars of used fruit and vegetable containers have been shipped back to the producing territories in the last few months.

LEND-LEASE FOOD DELIVERIES IN 1943 MORE THAN ELEVEN BILLION POUNDS

Deliveries of food and other agricultural products for export under the Lend-Lease Act in 1943 totaled 11,488,000,000 pounds, the War Food Administration reported recently. This is about double the 1942 deliveries of 5,730,000,000 pounds.

Quantities laid down at shipside during December were somewhat smaller than in November and October. December deliveries totaled 900,000,000 pounds, compared with

1,015,000,000 in November, and 1,115,000,000 pounds in October.

December deliveries consisted of the following major products (by weight): sugar, 19 percent; meats, 22 percent; dairy products, 12 per-

cent; dried eggs, 3 percent; fats and oils (excluding butter), 11 percent; fruits, 4 percent; vegetables, 8 percent; grain and seeds, 17 percent; miscellaneous foodstuffs, 3 percent; non-foodstuffs, 1 percent.

Mr. Citrus Grower:

You can help us help you by ordering your **SUMMER FERTILIZERS** and **INSECTICIDES...** well in advance of the time you plan to apply them.

Don't wait too long and run the risk of delays in delivery.



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.... FLORIDA

Red Aschersonia For Control Of Whiteflies

By E. W. BERGER, Entomologist,
State Plant Board of Florida

"The melancholy days have come, the saddest of the year," once sang an American poet. But while we might sing "the fungus days have come, the gladdest of the year for the citrus grower," they may be thought of, also, as very melancholy for such pests as scale-insects and whiteflies whose numbers are destroyed by billions, trillions, and quadrillions by the so-called friendly fungi that become unusually effective at the advent of the period of summer rains.

It has frequently been stated that Florida is unusually fortunate in having a climate so favorable for the development of the so-called friendly fungi. Of course, there are other such fortunate areas in the tropical and sub-tropical parts of America (including the West Indies), East Indies, India, Malaya, and others, where the various fungus parasites of scale insects and whiteflies are unusually effective in keeping these pests under control, saving fruit growers and others millions of dollars in spray and fumigation expenses.

The Red Aschersonia (Red Whitefly Fungus) is the best known and probably the most widely distributed of the fungus parasites of whiteflies in Florida and other Gulf Coast states.

It is called the Red Aschersonia (Red Whitefly Fungus) because it produces orange-red pustular growths on the bottoms of whitefly-infested leaves of citrus and some other plants. These pustules are in general as large in diameter as the immature scale-like stages of the whiteflies infected, ranging from say 1/32 to 1/8 inch. (Only the scale-like, immature stages of whiteflies are infected). The red is due to the accumulation of layers of reddish spores over the tops of the pustules.

Speaking of spores, these are the minute microscopic bodies that propagate a fungus. They may be of various shapes and colors. In the Red Aschersonia they are canoe-shaped and pale reddish. It is only when piled in numerous layers thick that they assume the rather striking orange-red of the mature

Editorial Note — It is a little early to look for serious damage from white flies in your citrus grove, but it is not too early to begin thinking about combative measures. This paper prepared by Dr. E. W. Berger contains valuable information which growers would do well to follow when white flies and scale begin their work of destruction.

pustules. In size they vary considerably so that from thirteen millions to fifty-two millions could be arranged one layer thick on the surface of a square inch. Not so large are they?

When one of these spores becomes lodged on a larva (immature scale-like stage of a whitefly) it

starts to germinate, moisture and warmth being suitable, penetrating the insect's skin, and gradually transforms the entire contents of the larva into a mass of fungus. Sooner or later other fungus threads grow out onto the surface where they produce the spores referred to.

The spores of the Red Aschersonia occur in gummy masses on the pustules referred to, where when wet with dew or rain they become softened and sticky and may be carried by walking or flying insects to whitefly larvae on the other leaves and trees. During heavy rain storms sporeladen droplets of water may be carried from tree to tree and farther.

It is, therefore, apparent how this fungus becomes gradually implanted in every tree in a grove or larger planting of citrus.

Advantage of these facts, largely



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It gives maximum efficiency at low cost.
It does not cause abnormal scale infestations.
It fits into normal spray combinations.
It is easily handled and disperses rapidly in the spray tank.

COPOFILM is naturally fine. (It is not a ground product.) Its 1200 per inch particle size and its 34% metallic copper content are properly balanced. This makes the material go farther and give better scab and melanose control Florida citrus growers have recognized the outstanding quality of COPOFILM.

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theoretical considerations at the time, was taken by the writer when he made his first attempts at spreading this fungus artificially.

As he recalls now, one of his first successful experiments consisted in pinning some Red Aschersonia bearing leaves on whitefly-infested leaves of a citrus tree in Lake City during the summer of 1906 and was gratified to note fungus starting on some leaves on the other side of the tree, indicating that insects carried the spores across. Additional experiments soon established the leaf-pinning method of starting the Red Aschersonia as a convenient method of starting growths of this fungus as well as other fungi.

The spraying-on of spores-in-water method was also found to work and was a quicker way of giving the fungus a wider distribution in the trees of a grove. Fungus material collected from trees was, of course, first used, but it was also soon found that artificially cultured material worked equally as well. Dr. H. S. Fawcett, then plant pathologist at the Florida Experiment Station, had succeeded in producing cultures of the Red Aschersonia in glass test tubes on plugs of sterilized sweet potato. Fungus material from some of these cultures was mixed with water, producing a mixture of spores and water and sprayed into whitefly infested trees, resulting in good growths of the Red Aschersonia.

Soon after the Plant Board was organized in 1915, it was suggested by Dr. P. H. Rolfs, previously a member of the Citrus Canker Committee and Director of the Florida Experiment Station, that it might be wise to produce pure cultures of the Red Aschersonia and supply them to growers who had learned to use this friendly fungus in the control of whiteflies infesting citrus trees, thereby obviating all risks of spreading citrus canker. By using fungus material collected from trees, there would always be the possibility of a grower collecting material from a tree lightly infected with canker and spreading it over an entire grove. By the use of pure cultures there could be no risk of spreading canker.

The writer having been associated with Fawcett in some of his fungus-culture work was delegated to produce an abundance of cultures.

With Fawcett's work of growing pure cultures in test tubes as a
(Continued on page 22)



When the weather opens up in the early days of spring, military units in training move "into the field." There, on maneuvers they test a specially planned strategy. On the mastery of such maneuvers may later depend the outcome of major engagements.

On Florida farms and groves, "spring maneuvers" play a significant part, too. On vegetable farms there is the all-important wind-up of the spring campaign — the harvesting of Florida's spring crops, so vital to the state and to the entire nation. On citrus groves owners are applying adroit tactics to a dozen tasks — spring and summer fertilizing, cultivation, irrigation where it is needed, pruning. Here on the Florida food front the farmer, practising the arts of peace in raising war crops, does a tremendous service for our fighting men.

For assistance and advice in your agricultural strategy, call on the Gulf field representative in your territory. For over 40 years it has been the job of Gulf field men to solve your individual problems. He can help you plan your spring maneuvers.

For Everything that
Grows in Florida... Use

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The LYONIZER

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Reports of Lyons Field Men . . .

HILLSBOROUGH & PINELLAS COUNTIES

C. S. (Charlie) Little

This territory is a swell section in which to work at the present time. The groves are in very fine condition and we have had one of the finest blooms that we have ever seen. Then just to make perfection we have had some needed rain that will be of much help in setting the fruit. While practically all of our mid-season oranges and grapefruit have been moved to market we still have a very nice crop of Valencias and we have been somewhat surprised by the lack of activity of the fruit buyers. Our summer application of fertilizer will be started about the 15th of April and without exception these mixtures will carry a complete range of secondaries.

SOUTHWEST FLORIDA

F. W. (Felton) Scott

The spring vegetable acreage will be increased to some extent over the plantings last spring. We are very happy to report that all vegetable plantings are getting off to a splendid start and with favorable weather conditions for the remainder of the season we should have a bumper crop to place on the market this spring. Vegetable prices for the past few months have been disappointing, but it is hoped that this situation will be better before we start with heavy movement of spring crops. Our citrus bloom has been good and recent rains were of great value in helping to set the new crop. We are practically through with the movement of all mid-season varieties and Valencias are now being moved to market.

POLK & HIGHLANDS COUNTIES

J. M. (Jim) Sample

The drought during early part of March did considerable damage to citrus groves in this territory, and in many cases growers were equipped to irrigate but due to the extreme labor shortage they found it impossible to get sufficient help to operate their irrigation systems. Many groves have bloomed and have a

very nice set of fruit, and others, due to the dry weather are now just coming out with the new growth and bloom. However, every indication is that we will have a very good crop of fruit. Valencias have been moving to market from this territory for the past month. There is a great deal of interest being shown by buyers for later Valencia movements and prices are very good. The summer application of fertilizer will start about the 15th of April and will be spread out over the following two months.

NORTH CENTRAL FLORIDA

V. E. (Val) Bourland

We still have some mid-season fruit to move from this section but it is being rapidly cleaned up with part of it moving to fresh fruit channels and the other part going to canning plants. Rains during the middle of March arrived just as we were beginning to suffer and have been of much help in setting our fine new crop of fruit. With the exception of local damage the drought did not affect us to any large extent. Vegetable prices have been unsatisfactory for the past month or two and some crops will not be shipped. The spring plantings of vegetable crops are about normal for this territory. Growers have been extremely busy with their spray program and are now thinking about their summer application of fertilizer which will be started a little earlier than in past years.

WEST CENTRAL FLORIDA

E. A. (Mac) McCartney

Prices on practically all vegetable crops have been entirely too low, and it surprising to see the wonderful attitude of the vegetable growers as they continue to plant their crops in the face of low prices. They are a faithful aggregation in their continued effort to keep the tables of the nation supplied with the very finest vegetables that can be produced and if there is one individual place where Federal agencies should cooperate in keeping a floor under prices it is in the vegetable market.

Hardee County

Hardee County, lying in the south central part of peninsular Florida offers opportunities in a wide range of diversified agriculture. This County produces some of the finest citrus fruits to be found in the state, all varieties of vegetables can and are being grown in certain sections of the county, and cattle are a main source of income.

The agricultural activities in Hardee County are under the supervision of the capable and aggressive County Agent, E. H. Vance, and due to his hard work with growers and cattlemen of the county much agricultural progress has been made during the past few years.

Citrus fruits are the most important source of income to the County. There are 11,000 acres of citrus fruits in the county with a large percentage of this acreage planted to oranges. It is estimated that 3,000,000 boxes of fruit will be produced in Hardee County this season, with this tonnage being moved by two local packing houses and by packing houses in adjoining counties. With a local citrus canning plant to take advantage of fruit not moving to the fresh fruit channels of the county has been very successful in disposing of their entire fruit crop with a minimum of waste.

Hardee County is one of the leading cattle counties of the state with 35,000 head of range cattle feeding from the ranges of the section. There are both high land and low land ranges that afford desirable grazing land in wet and dry weather and also during the winter. Growers in the county are showing a great deal of interest in improving their pastures and today more than 5000 acres have been thoroughly developed as improved pastures. This has been accomplished through the use of fertilizer materials and grasses particularly suited for the locality. There are 10,000 hogs in the county that supplies a large percentage of the pork used by the population of the county. There are four commercial dairies

(Continued on page 19)



Typical Scenes Pictured In Productive Hardee County

(Continued from page 18)
and these along with the family owned milk cows supply the milk requirements of the county.

Hardee County grows more than 3000 acres of various vegetable crops. The leading crops are tomatoes with 1200 acres and cukes with 1200 acres. The strawberry acreage, while small this season, is considered one of the main winter crops. Other crops being grown are pepper, cabbage, corn, lettuce, eggplant, and squash. These vegetable crops are an important source of income to the fifty percent or more people of the county that depend on the farm for a livelihood, and a very large part of the total vegetable crop is marketed locally through the Farmers' Market. There are two

canning plants in the county to can vegetables both for home consumption and for markets of the nation. One of these plants, located at Zolfo Springs, makes a speciality of canning sweet pepper.

Hardee County probably has more timber at this time than any other county in peninsular Florida. There still stands some virgin timber and this is very unusual for any part of the state.

With the scarcity of materials used in making containers for farm products, Mr. Vance, the County Agent, has been doing some splendid work in obtaining containers from the Army Bombing Range at Avon Park. He has been distributing these containers to farmers in all sections of the county to be used in pre-

serving of farm produce. This appears to be of great importance and other agents could well afford to look into this situation in their own particular section.

The poultry people of Hardee County are doing a swell job in supplying their part of poultry for the consuming public. There are 15,000 laying birds in the county and this, in connection with the broiler production, makes the poultry industry of real importance.

We certainly do salute Hardee County for it is here that with little effort of the part of the individual he can produce practically all commodities that are considered as essential for the sustenance of life. We are sure that Hardee County will never see the day when there will be suffering from hunger.



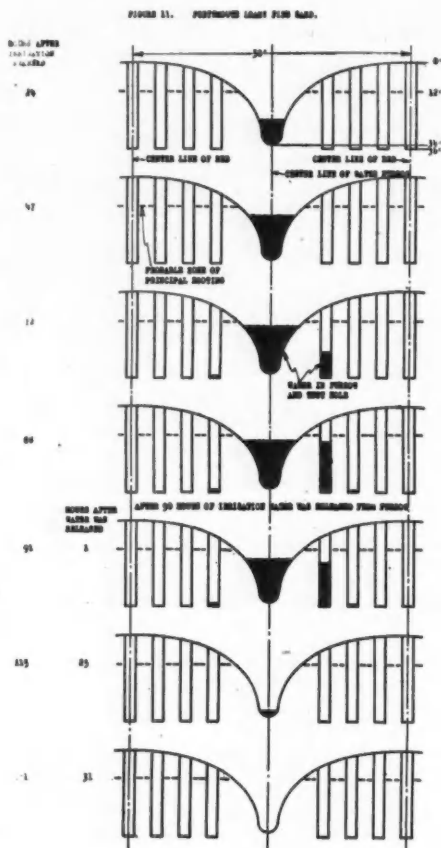
A STUDY OF THE IRRIGATION OF CITRUS GROVES IN VERO BEACH SECTION

(Continued from page 14)

but aeration is poor and not only are the roots deprived of oxygen, but favorable bacterial activities such as nitrification and ammonification are retarded. If the opposite condition prevails, that is, all of the pore spaces are occupied by

after reaching equilibrium with these capillary and gravitational forces is said to be at "filled capacity." The moisture percentage of different soils at field capacity varies according to the amount of pore space in the particular soil in question. For this reason the field capacity

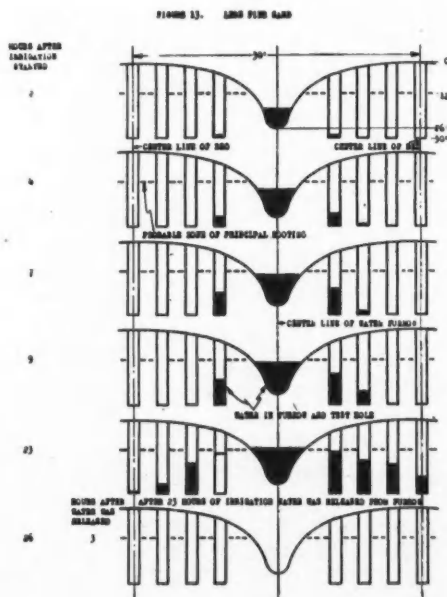
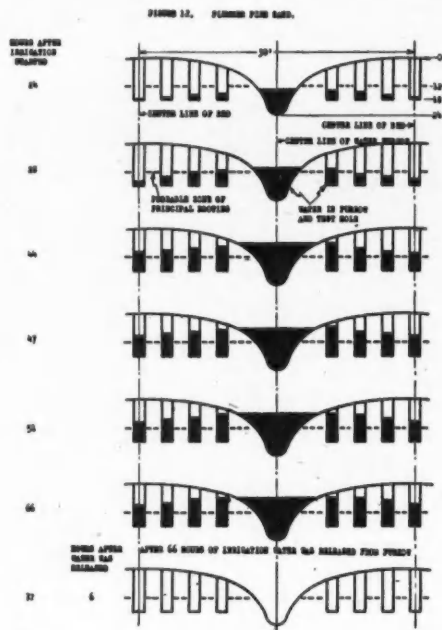
ly by gravity through large pores, cracks, and other such openings. For soil sanitation reasons it is highly desirable that it be removed from the probable zone of rooting as rapidly as possible. In fact, the saturation of the actual rooting for any period whatsoever is unde-



air, the only moisture in the soil is that imbibed by the soil colloids or strongly absorbed on the surface of the soil particles. Such moisture is completely unavailable to plants. Hence, it is evident that a desirable soil moisture condition would lie somewhere between these two extremes. It is now generally believed that the most desirably available soil mixture is that which occupies the smaller interstices of the soil. This provides ample moisture and allows for proper aeration at the same time. When water becomes distributed throughout the soil so as to be at equilibrium with the capillary and gravitational forces influencing its movement, such a condition is considered to exist. The moisture content of the soil

city of sandy soils would be relatively low as compared to a loamy soil.

That portion of water above field capacity in a soil moves large-



sirable, other than such a condition for a short time may be the only means of bringing the soil to field capacity under such circumstances.

(Concluded next issue)

YOUR CITRUS CROP IS GOING TO WAR



THE SOUTH PACIFIC

EUROPE

Use **ARMOUR'S BIG CROP FERTILIZERS** To Make Every Acre Do Its Best!

Your citrus groves will derive the greatest possible benefit from a consistent fertilizing program built around Armour's BIG CROP Fertilizers, and an Armour Field Representative will help you to plan a year-round schedule of cultivation and fertilization.

It's not too soon to order your fertilizer for the all-important summer application. Armour's is the wise choice because it has proved its value in thousands of Florida's finest groves . . . and because it's made right here in the state, for your crop and soil requirements. Drop a card to this office, asking a Field Representative to call at your convenience, without obligation.



ARMOUR
FERTILIZER WORKS
Jacksonville, Florida

FLORIDA CITRUS BY AIR EXPRESS?

(Continued from page 5)

four days. An airplane, flying at 175 miles per hour, would negotiate the same haul in about eight hours. Hence, a plane-load of produce leaving Florida late in the evening would arrive at Detroit early the following morning.

"Such speed would bring many products to market in better condition than at the present and the quality of some of them at time of harvest would be greatly improved. Tree- and vine-ripened fruits and vegetables are noticeably superior to produce picked in a green state and allowed to ripen in transit, not only in appearance, but in flavor and nutritive and vitamin content as well."

Ten "guinea-pig" cities, embracing 46 percent of the population of all metropolitan areas in the United States, were singled out for concentrated study by the research group, including Boston, New York, Philadelphia, Chicago, St. Louis, Atlanta, Washington, New Orleans, Los Angeles, and San Francisco. Their produce terminals unloaded 28 percent of the 28 billion ton-miles of traffic in fresh fruits and vegetables transported in 1941.

Pointing out that in 1941 the volume of all air-borne express totalled only a little over four million ton-miles, the study predicts that if the admittedly optimistic three-cent rate can be achieved, fully four billion ton-miles of fresh fruits and vegetables will become available for air transport. At five cents the prospective traffic amounts to one billion ton-miles, and at seven cents stands at a third figure. At the ten-cent rate, somewhat less than 50 million ton-miles are indicated, dwindling to 25 million at 15 cents. However, the report emphasizes the fact that even this figure is six times as great as the 1941 total for all air express.

RED ASCHERSONIA FOR CONTROL OF WHITEFLIES

(Continued from page 16)

basis, the writer adopted pint wide-mouth bottles in which to produce the Red Aschersonia cultures. Four or five plugs of sweet potato could be accommodated in a pint bottle, whereas, only one in a tube. The writer also began the use of agar as a medium for holding the sterilized plugs in sweet potato together against one side of the bottle. In

Regrouping In The Office Of Distribution

A regrouping of existing organizations within the Office of Distribution to establish a more direct line of authority is announced by Lee Marshall, Director of Food Distribution for the War Food Administration.

To define responsibilities and authority more clearly and to streamline administration, all programs and functions of the Office of Distribution will be assigned to four deputy directors.

C. W. Kitchen will be Deputy Director for Commodity and Industry Regulation. Lt. Col. Ralph W. Olmstead will be Deputy Director for Supply. S. R. Smith will be Deputy Director for Civilian Programs, and F. A. March has been named Deputy Director for Management.

Included in the regrouping of responsibility is a centralization of the WFA's food procurement and disposition functions. Under this arrangement, a newly-created Procurement Branch under the Deputy Director for Supply will be responsible for all food purchasing

other words, after having sterilized the contents of a bottle consisting of four or five plugs of sweet potato, each about the size of a finger, one gram of agar and about an ounce of water, stoppered with a plug of cotton batting, the hot bottle is placed on its side with the neck of the bottle sufficiently elevated so as to form, when the agar cools, what plant pathologists would call a sweet potato-agar slant. This type of culture has a far greater capacity for producing fungus material than a glass test tube. Fungus spores are sown over the contents of a sterilized bottle by means of a sterilized atomizer under a glass planting-hood about 2x2x1, properly sterilized.

Cultures mature in three to four weeks and are sold to those who desire them at cost, or one dollar each. A culture is sufficient for treating an acre of whitefly-infested trees. Printed directions are always supplied.

Information on the Yellow Aschersonia (Yellow Whitefly Fungus), the Brown Whitefly Fungus, as well as on the friendly scale-insect fungus-parasites may be seen in Extension Bulletin No. 88. Address Agricultural Extension Service, Gainesville.

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Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

Orlando and Mienola Oranges, 1200 trees on sour orange root. 600 trees on rough lemon root. Also acclimated California Eureka lemon trees (fruit seedless) 250 trees available. Also small seedless Persian lime, approximately 250 trees available, both on lemon rootstock. All varieties are two year old buds on three year old rootstock. For sale in lots of 100 or more trees at reasonable prices. Sherwood Bros. Nursery, P. O. B. 851, Coral Gables.

FOR SALE:

Approximately 30,000 ft. 8-5/8" O. D. 28.55 Used Black Steel Line Pipe, Plain End Beveled for Welding. Excellent pipe. Located in southern state. Utility & Industrial Supply Company, Jackson, Michigan.

WANTED — Superintendent of 450-acre citrus farm in Lake County. 12,000 trees Marsh Seedless, 7,500 Valencias, 17 years old. House furnished, good salary and bonus. Applicants, with first-class references apply to Box H of this magazine.

FOR SALE — Fruit-brusher machine, transverse type, complete with motor. Practically new. Cost \$540, will sell for \$300. P. O. Box 5253, Tampa, Fla.

Florida Agricultural Laboratory — Babson Park, Fla. Soil analyses and consultation on problems and programs. Consultant in Agricultural Processing and By-Products.

CITRUS TREES—Best quality usual varieties on sour orange or rough lemon stock. Robt. P. Thornton, c/o Clay Hill Nurseries Co., Box 2880, Tampa, Florida.

PLACE ORDER NOW Fall Delivery Citrus Trees. All Varieties. Paramount Grove Service, Box 843, Lakeland, Fla. 10-6t

ALYCE CLOVER SEED — Ripe and cleaned. Ideal cover and hay crop. Write for information. P. E. Snyder, Box 866, Lakeland, Fla.